



GHANA
CIVIL AVIATION AUTHORITY

ADVISORY CIRCULAR AC-AD-009

AIRCRAFT FUELLING, FIRE PREVENTION AND SAFETY MEASURES

GENERAL

Ghana Civil Aviation Authority (GCAA) Advisory Circulars from Aerodrome Safety and Standards (ASAS) contain information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated Regulations.

An AMC is not intended to be the only means of compliance with a regulation, and consideration will be given to other methods of compliance that may be presented to the Authority.

PURPOSE

This Advisory Circular (AC) provides information and guidance to aerodrome operators on the process for protecting persons and property during the storing, dispensing, and handling of fuel.

REFERENCE

The Advisory Circular relates specifically to the Aerodrome GCARs and Manual of Standards (MOS).

STATUS OF THIS AC

This is the first AC to be issued on this subject.

FOREWARD

This document provides guidance to Aerodrome Operators on Aircraft Fueling, Fire Prevention and Safety and outlines the scope and process for the conduct of Fuelling Operations.

APPROVAL

Issue No : 01	Approved by:  _____ Director-General	_____ 2015
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1. FUELLING OPERATIONS AND FACILITIES

For the purpose of this article: 'aviation fuel' means fuel intended for use in aircraft; 'aviation fuel installation' means any apparatus or container, including a vehicle, designed, manufactured or adapted for the storage of aviation fuel or for the delivery of such fuel to an aircraft.

1.1. FUEL STORAGE AREAS AND UNLOADING/LOADING STATIONS

- (a) Fuel storage areas will be fenced, locked when unattended, and posted with signs to reduce chance of unauthorized entry and/or tampering.
- (b) Fuel storage areas and unloading/loading stations will be posted with "No Smoking" signs.
- (c) Fuel storage areas and unloading/loading stations will be free of materials, equipment, functions, and activities that could be ignition sources.
- (d) Piping will be underground or reasonably protected from damage by surface vehicles.
- (e) Fuel storage areas and unloading/loading stations will be equipped with a minimum of two accessible fire extinguishers, at least 9kg ABC rated.
- (f) Electrical equipment, switches, and wiring in fuel storage areas and unloading/loading stations will be explosion proof and reasonably protected from heat, abrasion, or impact which could cause an ignition source.
- (g) Piping, filters, tanks, and electrical components will be electrically bonded together and interconnected to an adequate ground.
- (h) Unloading/loading stations will be equipped with bond/ground wire with appropriate clip for grounding tankers and mobile fuelers.
- (i) Loading stations will be equipped with a deadman control feature.
- (j) Loading stations will be equipped with a boldly marked emergency cut-off capable of stopping all fuel flow with one physical movement. The emergency cut-off must be located outside the probable areas and near the route that normally is used to leave the probable spill areas or to reach the fire extinguishers provided for protection of the area.

1.2. MOBILE FUELERS

- (a) Mobile fuelers will be marked with letters at least 3 inches high on all sides to show flammability, and display standard hazardous material placards. A "NO SMOKING" sign will be posted in the cab. Smoking equipment such as cigarette lighters and ashtrays shall not be provided, and shall be rendered inoperable if procured.
- (b) Mobile fuelers will be equipped with a minimum of two fire extinguishers, at least 9kg-ABC rated, each accessible from a different side.
- (c) Mobile fuelers will be equipped with a system capable of overriding all other controls and stopping all fuel flow with one physical movement. Emergency fuel cut-off should be boldly marked. Mobile fuelers will also be equipped with a tank bottom outflow cut-off valve that can block fuel flow in the event of piping rupture or valve failure.
- (d) Fuel tanks on mobile fuelers will be equipped with gasket dome covers that contain an emergency vapour pressure relief valve and are adequate to prevent fuel spillage during vehicle movement.
- (e) Electrical equipment, switches, and wiring in mobile fuelers, will be explosion proof and be reasonably protected from heat, abrasion, or impact, which could be an ignition source.
- (f) Mobile fuelers will be equipped with bonding wires/clamps to facilitate prompt, definite electrical bond connection to aircraft during fuelling operations.
- (g) Fuel systems on mobile fuelers will have electrical continuity between all metallic or conductive components.
- (h) Fuel system piping on mobile fuelers and cabinets will be reasonably protected from impact/stress that could cause fuel spillage.
- (i) All nozzles on mobile fuelers will be controlled by a deadman flow cut-off feature.
- (j) Mobile fuelers will be equipped with a spark arrestor and leak-free exhaust system terminating in a standard baffled muffler. The exhaust system on mobile fuelers will be routed under the front of the cab or be shielded if under the fuel storage tank to prevent concentrated fumes from contacting the exhaust system if overfilled or leaking.

1.3. RESPONSIBILITIES OF FUELLING PERSONNEL & MANAGEMENT STAFF

Fuelling personnel and management staff will ensure that:

- (a) appropriate clothing is worn. Garments shall be made of fabric other than silk, polyesters, nylon with wool, or other static generating fabrics. Shoes shall not contain taps, hobnails, or other material that could generate sparks.
- (b) matches or cigarette lighters are not carried, that could become an ignition source if operated, bumped, hit, or dropped.
- (c) fuelling is performed only outside, never in a building.
- (d) mobile fuelers should not park closer than 10 feet from each other or closer than 50 feet from a building, except for fuel truck maintenance facilities approved by the GCAA.
(GCAA note: These distances can be reduced with approval by the local fire authority due to space limitations and apron layout. At some airports, fuel truck parking may be more of a hazard to taxiing aircraft if located 50 feet from all buildings.)
- (e) all fuel systems and mobile fuelers are grounded, or at least bonded between aircraft, tankers, or fuelers, before commencing fuel transfer operations.
- (f) before opening any aircraft or mobile fueller tank or commencing any fuelling operation, and at all times during fuel transfer, at least a bonding wire is connected between mobile fueller and loading station or between fueller and the aircraft being fuelled.
- (g) all fuelling equipment is in good operating condition and free of fuel leaks prior to use.
- (h) all fuel storage areas and equipment is kept neat and free of trash or debris that could contribute to the spread of fire.
- (i) all fire extinguishers are sealed and charged, and that they are inspected at least every six (6) months.
- (j) fuel service operations are suspended when there are lightning discharges in the immediate vicinity of the airport.

2. INSPECTION OF FUELLING OPERATIONS

DAILY INSPECTIONS OF FUELLING OPERATIONS

The daily inspection on aircraft fuelling operations should concentrate on a quick inspection for the most common problems concerning compliance with fire safety codes at fuel storage areas and with mobile fuelers.

The inspection should also include security, fire protection, general housekeeping, and fuel dispensing facilities and procedures.

A more detailed fuelling operation inspection should be scheduled quarterly (see Quarterly Fuelling Operations under Periodic Condition Inspection).

(i) Determine if the fuelling operator is permitting any unsafe fuelling practices or is in violation of local fire code, such as:

- failure to bond aircraft with the mobile fuelers during fuelling operations
- fuelling personnel smoking while fuelling aircraft.

(ii) Check to ensure that the appropriate signs for the fuel farm are installed and that all gates are locked except when the facility is occupied by an authorized user.

Report and monitor any unsafe fuelling practices and violation of fire codes. Report any noncompliance with fuel fire safety procedures specified in the GCAA-approved Aerodrome Operations Manual.

2.1. QUARTERLY INSPECTIONS OF FUELLING OPERATIONS

Certificated airport are required to establish fire safety standards for safe fuelling operations and conduct quarterly inspections of the fuelling facilities. The fire safety standards for fuelling operations should be listed in the Aerodrome Operations Manual (AOM) and the quarterly inspections should be conducted for compliance to the fuelling fire safety standards listed in the AOM.

2.2. FUEL STORAGE AREAS AND LOADING/UNLOADING STATIONS

- i. Check fuel storage areas for adequate fencing and security to prevent unauthorized access or tampering.
- ii. Check for “No Smoking” signs that are clearly visible.
- iii. Check fuel storage areas for materials such as trash or vegetation that could contribute to the spread of fire.
- iv. Check for equipment, functions or activities that could be ignition sources.
- v. Note if fuelling equipment appears to be in good operating condition and free of fuel leaks.
- vi. Check piping for reasonable protection from damage by vehicles if piping is above ground.

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- vii. Check fuel storage areas for at least two accessible and serviceable fire extinguishers. Where the open hose discharge capacity of the equipment is more than 750 litres per minute, at least one wheeled extinguisher with at least 55kg of agent is also required.
 - viii. Check for explosion proof equipment, switches and wiring that is reasonably protected from heat, abrasion or impact, which could cause an ignition source.
 - ix. Check for piping, filters, tanks and pumps being electrically bonded together and interconnected to an adequate grounding rod.
 - x. Check for a serviceable bond/ground wire with clip at each loading/unloading facility for grounding tankers and mobile fuelers.
 - xi. Check loading stations for deadman control features.
 - xii. Look for a boldly marked emergency cutoff capable of stopping all fuel flow with one physical movement. The emergency cutoff should be located outside the probable fuel spill area near the route that normally is used to leave the spill area or to reach the fire extinguishers.

2.3. MOBILE FUELERS

At least once every 3 months, inspect all fuel trucks to ensure they meet fire safety standards. The inspector should:

- (i). Note if mobile fuelers appear to be in good operating condition and free of fuel leaks.
- (ii). Check mobile fuelers for parking at least 50 feet from a building and at least 10 feet from each other. Note: Some airports have a mobile fueller maintenance building that is approved by the local fire service.
- (iii). Check for flammability decals on all sides. Lettering should be at least 3 inches high. Also check for hazardous materials placards on all sides.
(The Hazmat number for Jet A trucks should be **#1863** and **#1203** for 100LL trucks).
- (iv). Check the cab for a "No Smoking" sign and the presence of smoking equipment. Ashtrays and cigarette lighters are not to be provided.
- (v). Check for two fire extinguishers, accessible from each side of the mobile fueller. Fire extinguishers should be charged, sealed and tagged from the last fire extinguisher inspection.
- (vi). Check dry chemical extinguishers to ensure they are only B-C rated. ABC rated multi-purpose dry chemical extinguishers are not to be used on mobile fuelers as they are highly corrosive to aircraft and can cause significant damage to aircraft engines.
- (vii). Check emergency fuel cutoffs to ensure they are boldly marked and operable. There should be an emergency fuel cutoff accessible from each side.
- (viii). Check electrical equipment, switches, wiring and tail light lens covers for explosion proof construction and reasonable protection from heat, abrasion or impact which could be an ignition source.
- (ix). Check for serviceable bonding wires and clamps.
- (x). Check nozzles for deadman control feature.
- (xi). Check the vehicle exhaust system for exhaust leaks and for adequate shielding if it extends under the fuel tank portion of the vehicle.